

Project 2

Consider a network system composed of several IP routers.

Each router is part of an Autonomous System (AS) and is connected to one or more routers, belonging either to the same or to a different AS. Every router executes the BGP protocol and interact with the other routers according to routing policies detailed below.

Each router can be also connected to one or more local networks, which provide network access to end hosts. A router connected to a local network can be configured as DHCP server for said network.

TASK 1

Design and implement a network-automation system, automating the following task:

- device provisioning: automatic creation of startup-config files for every router in the network, allowing a network administrator specifying the following parameters:
 - IP address of all interfaces;
 - AS number;
 - BGP neighbors;
 - Configurations of the DHCP server.

TASK 2

Using containerlab and arista switches, deploy and configure the network described in Figure 1, according to the following guidelines:

- configure DHCP servers for each local network;
- configure each router to announce all its local networks through BGP;
- configure AS55001 as transit for AS55002;
- configure AS55020 as transit for AS55001;
- configure a *peering* relation between AS55010 and AS55002;

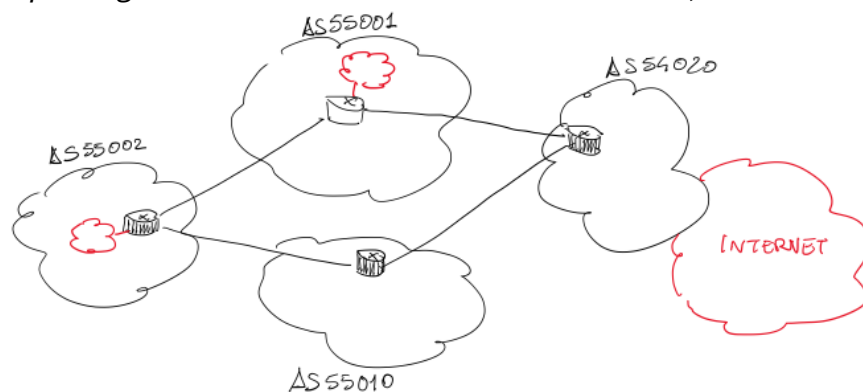


Figure 2 - Network deployment

TASK 3

Design a software system to automate network testing using iperf and tcpdump. The system should allow a user to:

- specify the *name* of the source and destination hosts of iperf-generated traffic;
- specify which interface of which router to monitor for traffic.

Given the information above, the software has to automatically deploy and execute iperf on the specified nodes, and check whether traffic belonging to said communication is going through the specified interface.